

City of Canton

Engineering Design Standards
For
Public Improvements

City of Canton
210 N. Dakota St.
Canton, SD 57013

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City of Canton Engineering Design Standards for Public Improvements

Here for your easy reference is a manual setting forth the engineering design standards for public improvements within the city of Canton. Attention and compliance to these standards will result in less confusion and uncertainty in planning, designing, and constructing these improvements within the city. These standards are also developed to reduce the maintenance costs and minimize operational problems associated with public improvements for the City, its citizens and taxpayers. These standards are by no means all-inclusive. However, they do provide the basic design principles and standards to be used in developing public improvements.

Chapter 10 Water Mains

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Chapter 10 Water Mains

10.1 General

10.1.1 This Chapter sets forth the design and technical criteria to be used in the preparation of all water main plans. Where design information is not provided herein, the following standards (most current edition) shall be used:

1. "Recommended Standards for Water Works Great Lakes-Upper Mississippi River Board of State Sanitary Engineers." (Ten State Standards)
2. Requirements and Standards of the South Dakota Department of Environment and Natural Resources.
3. American Water Works Association Standards.
4. South Dakota Plumbing Code.
5. Uniform Plumbing Code of International Association of Plumbing and Mechanical Officials.
6. National Fire Protection Association (NFPA)
7. Conflict - In case of a conflict between the above design standards, the most restrictive requirement shall apply.

10.1.2 Construction Standards. Construction standards shall be the most recent revision of the City of Canton Standard Specifications and the City of Canton Standard Plates. All details, materials, and water appurtenances shall conform to these standards.

10.1.3 Where a conflict occurs between the above standards, the most restrictive requirement shall apply.

10.1.4 An average daily water flow rate of 1,500 gallons per minute with a residual pressure of 20 psi at the most remote hydrant shall be maintained for all residential developments. Multifamily, commercial, and industrial developments shall be designed according to acceptable methods to determine their water flow demands. The Insurance Services Office (ISO) fire flow guidelines may be used as an acceptable method of calculating water flow rates.

10.1.5 Arterial or feeder mains, 12-inch diameter or larger, will be located on mile roads. Wherever possible, they shall also be located on half-mile roads, but never more than 3000 feet apart.

10.1.6 Minimum size water main shall be 8-inch diameter, except that dead end water mains less than 500 feet in length may be 6-inch diameter. Dead-end mains longer than 500 feet shall be 8-inch diameter.

10.1.7 Water mains on cul-de-sacs must terminate with a fire hydrant.

10.1.8 Depth of cover shall be 6-feet minimum. Where a dip must be placed in a main in order to pass under another utility, the length of the deeper main shall be kept to a minimum, and bends shall be used to achieve the desired offset. The existing main may be lowered in place, if this method is practical and acceptable to the City.

10.1.9 Disinfection, bacteriological and hydrostatic tests shall be required in accordance with the Canton Standard Specifications before acceptance.

10.1.10 Mains shall be located so as to best conform with the layout of existing facilities. In streets where no pattern has been established, mains shall generally be located ten (10) feet to the north or west of the center line. A minimum horizontal separation of ten (10) feet shall be provided between water mains and sanitary mains and storm sewer mains except as allowed in the Ten States Standards and as noted in Chapter 4 of the City of Canton Engineering Design Standards.

Water mains shall be at least twenty (20) feet away from buildings and under paved areas whenever possible. Water mains will not be allowed under buildings and must be encased under enclosed walkways and tunnels.

10.1.11 Finish grades for all hydrants shall be shown on the plans.

10.2 Fire Hydrant Location

10.2.1 For arterial streets, fire hydrants shall be staggered on both sides of the street such that they are spaced not more than 500 feet along the centerline of the street. Fire hydrants on each street side shall be spaced at not more than 1000 feet measured along the centerline of the street. For collector and local streets, fire hydrants shall be spaced at not more than 500 feet on along the centerline of the street. Private fire hydrants shall be provided to meet the fire code when distance to the nearest hydrant is greater than those prescribed by the fire code.

10.2.2 Spacing of hydrants around multiple family, commercial, or manufacturing establishments shall be considered as individual cases and shall be determined by consultation with the City.

10.2.2.1 Fire hydrant systems on Private Property.

Where fire hydrants including associated water mains and appurtenant items are installed on private property a minimum of a twenty-foot water main easement shall be granted to the City for maintenance and operation. **No Private Fire Hydrant system shall be allowed.**

10.2.3 Hydrants shall be located on the road right-of-way, 3 feet from the back of curb for sidewalk adjacent to boulevards and on a lot line whenever possible. Fire hydrants installed within curbside sidewalk shall be located 2 feet behind the back of curb and on a lot line whenever possible.

10.2.4 Fire hydrants shall be installed on the end of all dead-end mains. If the main terminates in a cul-de-sac, the fire hydrant shall be installed to meet clear space requirements as outlined in 10.2.7.

10.2.5 For commercial construction, fire hydrants shall be located at least 25 feet from the exterior wall of any masonry building and at least 50 feet from any exterior wall of frame or equivalent construction, including brick and stone veneer.

10.2.6 Flushing hydrants installed for testing purposes shall be removed once testing has been completed. If the flushing hydrants will remain in place for the duration of a winter season, they shall be installed behind the proposed curb and gutter.

10.2.7 A minimum of five (5) foot clear space shall be maintained around the circumference (outside) of fire hydrants, except as otherwise required or approved by the City Engineer. Light poles, posts, fences, vehicles, vegetative growth, trash, storage, mailboxes and other materials or things shall not be placed or kept near fire hydrants in a manner that would prevent such fire hydrants from being immediately discernable and/or usable. The fire department shall not be detoured or hindered from gaining immediate access to a hydrant.

10.2.8 When fire hydrants are located outside City ROW and are subject to impact by motor vehicles, guard posts, curb and gutter or other approved means shall be provided for hydrant protection.

10.2.9 Fire hydrant(s) shall be installed not more than 100 feet from fire department connection(s) serving any buildings equipped with a standpipe system.

10.2.10 Fire hydrant(s) shall open counterclockwise and shall be red in color.

10.3 Gate Valves

10.3.1 In general, gate valves on cross connecting mains shall be located so that no single break requires more than 800 feet to be out of service, and on feeders 12 inches or larger, gate valves shall be spaced not more than 1/4 mile apart. Gate valves shall be arranged so that any section can be isolated by closing not more than four gate valves, with a maximum of 30 residential lots out of service.

10.3.2 Gate valves shall generally be located such that they will not be in the sidewalk line or in driveways.

10.3.3 All gate valves shall be installed with a valve nut centering device and valve box.

10.3.4 Valves shall be placed on all dead-end mains for future extension, unless no services are planned and chlorination can be redone without interruption to anyone.

10.3.5 Perpendicular connections of new mains to existing mains shall be by a smith tap or by a cut and tie to the existing main.

10.3.6 Gate valves and curb stops for fire lines and domestic services shall be installed at least 20 feet away from the building. If the domestic service comes off of the fire line, both lines must have a shut off valve after they separate.

10.3.7 Valves shall open counterclockwise.

10.4 Meters

10.4.1 One 5/8" or 1/2" meter with Remote Terminal Unit (RTU) shall be supplied by the City of Canton for installation by the property owner. Additional 5/8" meter(s) with RTU or any meter larger than 5/8" with RTU shall be furnished and installed by the property owner. All meters and appurtenant items shall be approved by the City of Canton prior to installation.

10.4.2 Master meters and Remote Terminal Units for main line metering of industrial and commercial complexes shall be subject to the approval of the City of Canton. Authorization must be obtained from the City of Canton Water Department to allow the use of a master meter in lieu of individual meters. The meter shall be installed in an approved vault or an approved heated and ventilated above-grade enclosure.

10.4.3 Water meters shall be installed as close as practical to the point where the water service enters the building and **must** be located upstream of any valves (except air valves), tees, take-offs, diversions or branches of any type. Location of the remote terminal unit shall be approved by the City of Canton Water Department.

10.5 Backflow Prevention

All lawn sprinkler and irrigation systems shall be equipped with suitable backflow preventer in compliance with the Uniform Plumbing Code, where they are connected to the Municipal Water Supply System.

10.6 Special Requirements for Automatic Sprinkler Fire Protection Systems

Sprinkler systems directly connected to public water supply shall be isolated from the public water main by an approved double check valve assembly or backflow preventer such as those manufactured by Watts or Beco or equal.

10.7 Service Lines

10.7.1 Not more than one consumer shall be supplied from each service line. Each separate account requiring a separate meter shall also require a separate service line except for the following:

10.7.1.1 If a separate account requiring a separate meter for the purpose of lawn irrigation, a separate service line is recommended but is not required

10.7.2 Side by side duplexes, triplexes and town houses shall have a separate account and a separate service line for each unit. The service lines shall be located on the individual consumer's property whenever possible. Easements shall be obtained where this is not possible.

10.7.3 Apartments and over/under duplexes, triplexes, etc. do not need to be individually metered and do not need separate service lines.

10.7.4 Residential service lines shall either be constructed to the property line or to a point 3 feet behind the curb as a part of the street construction project. Service lines shall typically be installed twenty feet from the downstream lot corner.

10.7.5 Commercial and industrial service lines may be constructed to the property line if the service line size is known.

10.7.6 All service lines shall be marked by a steel fence post or an approved marker. The steel fence post should be painted blue on the top one-foot portion of the marker. The marker should be placed near the curb stop or at the termination point of the service stub-in. The service line marker shall remain in place and maintained by the property owner until the service line is extended into the property to serve a house, building, or other structure. The property owner will be responsible for replacing damaged markers.

10.7.7 If newly developing separate platted properties are replatted to a single unit, any additional water services that were previously installed shall be removed to the corporation stop on the City main at the expense of the owner provided the final lift of asphalt or final surfacing has not been installed.

10.7.8 Material Requirements:

10.7.8.1 Service lines 2 inches in diameter and smaller within street right-of-way or within utility easements shall be soft copper tubing with flared ends.

10.7.8.2 Service lines 2 inches in diameter and smaller outside the street right-of-way and outside utility easements shall be soft copper tubing with flared ends, restrained joint PVC (Yelomine) or high density polyethylene (HDPE) pressure pipe.

10.7.8.3 Water service lines 4 inches in diameter and greater shall be ductile iron pipe or C900 PVC pipe.

10.7.8.4 All other service line materials not listed above will not be allowed unless specifically approved by the City.

10.7.9 For new construction, there shall be a minimum of 10 feet of horizontal separation between the sanitary sewer service and the water service from the respective mains to the structure being serviced.

10.8 Material Specifications

10.8.1 Material specifications are included in the Canton Standard Specifications.

10.8.2 Ductile iron pipe is required to be used in all sites known to have soil contaminated by volatile organic compounds such as fuel and petroleum products or as directed by the City. All ductile iron pipe and fittings shall be encased in polyethylene regardless of soil conditions.

10.9 Manufactured Home Parks

10.9.1 New manufactured home parks shall have individually metered services and the distribution system within the park shall be built to meet the Supplemental Standard Specifications, the Standard Plates and the Design Standards. Maintenance and access easements granted to the city for the water main and the service lines to the curb stop are also required.